A Framework for Ecosystem Management Research in the Colorado Front Range: Incorporating the Human Dimension

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INTRODUCTION

Many have noted the fundamental changes occurring today in natural resources science and management (Gordon, 1994; Salwasser, 1994; Malone, In Press; Knight and Bates, 1995). New paradigms, captured in the phrase, ecosystem management, suggest new or at least redefined roles and practices for both science and management. Although a standard definition of ecosystem management does not currently exist, a set of commonly understood basic principles for ecosystem management have emerged (Kaufmann et al., 1994; Sample, 1994; Lackey, 1995; Wood, 1994; Grumbine, 1993). One of the most important principles guiding ecosystem management is the central role of humans in ecosystems and the importance of human values and needs as a component of ecosystem sustainability and productivity.

Increased emphasis on the human dimensions of natural resources significantly affects the approach to and implementation of ecosystem research. Traditionally, the creation of knowledge primarily has been a scientific endeavor. Important research questions and methods to answer these questions, were for the most part, identified and addressed by scientists. Research findings were communicated to other scientists in a form not readily useable by the nonscientific community. The traditional science culture (including language, norms, rewards, institutions) thus made

implementation of many of the fundamental principles of ecosystem management difficult, especially integration of disciplines, stronger linkages between research and management, and shared decision-making. Focusing on human dimensions (understanding what people want and why, and developing mechanisms to enhance cooperation and collaboration) is a critical step toward creating new cultures and paradigms supportive of ecosystem management and science.

STUDY OBJECTIVES

The Colorado Front Range Ecosystem Management Demonstration Project, sponsored by the Rocky Mountain Forest and Range Experiment Station, attempts to integrate human dimensions more directly in ecosystem management research. Starting with the premise that many important ecosystem science questions come from outside the science community, this study was initiated to (1) identify priority research issues for the Colorado Front Range, (2) propose a framework for conducting ecosystem management research, and (3) examine the current status and role of partnerships in ecosystem science and management. This paper presents the results of this study.

THE COLORADO FRONT RANGE

The Colorado Front Range of the Rocky Mountains is comprised of diverse terrestrial ecological systems including alpine, subalpine, montane, woodland and grassland with associated riparian

corridors and aquatic ecological systems. It includes the headwaters of two major river basins, the South Platte and the Arkansas. Three million people live in or adjacent to the Front Range in areas ranging from isolated mountain homes, ranches, mountain subdivisions, and small communities to major urban centers. This study focused on two study areas in the Colorado Front Range; the Arapaho-Roosevelt Forests and the Pike-San Isable Forests. Both are located at the urban/wildland interface and are considered Front Range forests. They were chosen as study sites because of their significant population growth and the associated high degree of urban resident use impacting forest land management.

ECOSYSTEM MANAGEMENT RESEARCH ISSUE IDENTIFICATION

Objectives and Methods

Four separate focus group workshops were held to identify research priorities and to create a framework for conducting effective ecosystem management research. To identify major issues and specific research needs, one-day workshops were held in Fort Collins and Colorado Springs with citizens and representatives from state, federal and nonprofit groups. To assess these issues and begin to develop a model for research implementation, thirty researchers attended a second workshop in Fort Collins. Finally, a special Ecosystem Management Research Panel was convened to review all information gained from the workshops and to assist in creating a framework for ecosystem management research in the Colorado Front Range.

The Nominal Group Method was used to identify major ecosystem management research issues in the Colorado Front Range, their relative importance to one another, and specific strategies to address them. Delbecq and Van De Ven (1971) list the following objectives of the Nonimal Group Process: "(1) to facilitate problem definition by a rich input of problem dimensions through nominal group techniques, (2) to focus attention on those items which have the highest priority in the clients' perspective, (3) to avoid reaching toward a limited few "leaders" or a single client group to create the definition of the client problem, (4) to force professionals to react to the realities of client perceptions rather than to their own theoretical or professional biases, (5) to create sufficient tension to assure responsiveness on the part of the professional organization to clients, (6) to provide a mechanism for the interfacing of both clients and professionals in a manner which avoids mutually frustrating semantic hangups; and (7) to increase the legitimation of later program proposals by early involvement of client groups".

The Nominal Group Method is a straight-forward, structured process. At the Fort Collins and Colorado Springs workshop, each participant was asked to list on a card important ecosystem management research issues. Proceeding in order around the table, issues were recorded on a flip chart as each person described a topic of concern. After all issues were listed, participants asked clarifying questions, categorized issues where similarities existed, and omitted redundant topics. In the final step, each

participant received 5 points to distribute according to the perceived importance of the issues. Thus a person could allocate all 5 points to one issue, or divide points among issues. This method also was used during the second part of the workshop when participants were asked to identify the kinds of specific information needed to address high priority issues.

The structured format of the nominal group process has a number of important advantages. One, useful and prioritized data are produced. Two, input can be gained from many individuals representing diverse viewpoints, while at the same time minimizing the probability that a few strong participants will dominate the process. Three, in addition to quantifiable data, qualitative information is collected through clarification and discussion. Four, the discussion stays focused on the objectives of the meeting, unlike other sessions where the discussion can wander and get off track.

The nominal group process is especially appropriate for today's emphasis on public participation in ecosystem management. It encourages agreement rather than disagreement, guides planning by identification of priority issues, and forms partnership groups whose work continues through subsequent phases of a project. Results of a nominal group, however, always should be reviewed with an eye to group composition. When all viewpoints are not represented around the table, additional effort needs to be made to confirm the validity of group outcomes.

Issue Identification Workshops (Fort Collins and Colorado Springs)

Eleven people attended the Fort Collins Workshop and 16 people attended the Colorado Springs workshop. Of this total, 17 were from federal government, 3 state government, 2 nonprofit organizations, and 5 Colorado citizens. The expression of major issues differed somewhat between the two focus groups (Tables 1 and 2 and Appendices 1 and 2). As mentioned previously, results need to be carefully reviewed in relation to participants' perspectives. Thus in the Fort Collins Workshop, with the greatest number and percent of federal managers and researchers, it is perhaps not surprising that **Data Knowledge** or the lack of knowledge and predictability was thought to be the major issue facing research. **Sustainability** questions such as, "how do we identify and manage natural systems sustainably" were next in priority, followed by **Population Growth** pressures, trends, conflicts, and impacts, and **Collaborative Strategies.** Participants in the Colorado Springs workshop, reflecting more of a citizens concern, identified **Education** as the most important issue. They suggested new programs are needed to ensure that young people, the public and decision makers have a better understanding of ecosystems and natural resources so that they can more effectively participate in informed decisions. Similar to the Fort Collins workshop, **Population Growth** and **Collaboration** also were research areas of significant concern to the group. **Environmental Degradation** including air quality and habitat fragmentation and the **Mechanisms of Ecosystem Management**

(i.e., managing systems instead of species and recognizing ecosystem management as a social process) were the next two priority topic areas. Finally, participants at both workshops identified information gaps that exist in relation to the priority research issues. For instance, Appendices 3 and 4 lists the kinds of research suggested by each Focus Group to address a number of priority issues.

Researchers Workshop

A workshop of 25 university and agency scientists participated in the second phase of the issue identification project. The charge to the scientists was to design a Colorado Front Range Ecosystem Research and Knowledge delivery system, and, to develop specific projects needed to implement this design. Scientists were provided results from the two focus group workshops as the basis for their assignment.

Researchers were divided into three groups and results of each group are presented in Appendix 5. Although valuable information was gained, time allotted for this task was not sufficient to reach agreement about research delivery system design or overall priority projects. To more successfully address these objectives, a smaller expert panel was established.

Ecosystem Management Research Panel (EMRP)

The EMRP consisted of 6 members: John Gordon, Professor Yale School of Forestry & Environmental Studies; Christopher Pague, Director Colorado Heritage Program; Robert Ward, Director Colorado Water Resources Research Institute, Skip Underwood, Supervisor U.S.

Forest Service Arapaho-Roosevelt Forest; and the study's principle investigators Al Dyer and Joyce Berry, Colorado State University.

The EMRP's initial discussion focused on the current state of ecosystem management research and reached the following conclusions:

1. Both research and management of forests are in a period of fundamental change.

2. Although ecosystem management is not an entirely new concept or practice, its broader acceptance and visibility are leading to totally different ways of "doing business".

3. Although the science base for ecosystem management is incomplete and scattered, we clearly know enough to do ecosystem management.

4. The major barriers to ecosystem management are primarily social and political, not biological factors (i.e., private property rights issues, value conflicts, etc.).

5. Inherent conflict exists within ecosystem management research because of the basic differences between the needs of managers for immediate answers versus the role of scientists to create knowledge that is seldom the "ultimate answer" and is never reported as absolute certainty.

Given the above, the Panel agreed that a better approach and structure is needed to make ecosystem management and research more effective. The Panel recommended development of a three part science structure for the Colorado Front Range. Given this restructuring, science-based assessments, client-based research,

and basic research create the framework and delivery system for ecosystem management research. The distinguishing features of the three models are:

Science-Based Assessments: Assessments synthesize what is currently known about a specific issue or policy question and forecast future policy or management options and the consequences of these options. Assessments generally are tightly time-bound, with results needed relatively soon to provide information for decision-makers.

Client-Based Research: Client-based research questions, similar to assessments, come from outside the science community. However, unlike assessments, the process for arriving at priority issues is generally more complex, the time-frame for achieving objectives is longer, the partnerships formed are more structured and long-term, and research often includes the creation of new knowledge as well as research synthesis. All three types of research are moving towards integration of science disciplines both social and biological, but client-based research will usually require the most integration. Monitoring and evaluation is also an important element of client-based research.

Basic Research: The distinguishing feature of basic research is that the research questions come from within the science community, and generally the products of basic research take a longer time to achieve and are focused on larger landscapes and temporal conditions. Unlike the above two models, basic research often does not focus on management or policy, but instead, develops

the fundamental knowledge needed to understand how and why ecosystems, or their component parts, function.

Tables 3 and 4 list priority issue areas for client-based research and science assessments, and, basic research, identified by the Panel from their review of workshop results. Assessments and client-based research are presented together because both are addressing questions that have a more immediate policy or management application. It is important to note that differences between the three types of research are not always distinct, but become clearer when identifying the following features of a particular project: time-frame, scale, need to produce new knowledge, focus on policy/management problem, issue initiation, integration of sciences, and diversity of partners.

Finally, the Panel recommended that a Colorado Front Range Ecosystem Cooperative is the best way to restructure research to address management, policy and science needs. This Cooperative would (1) include participants from all sectors, private and public, (2) standardize methods and rules for data while retaining quality control, (3) be flexible and allow for different kinds of research depending on the problem or question, and (4) provide scarce financial resources by cost sharing among all participants.

ECOSYSTEM MANAGEMENT RESEARCH PARTNERHISP

The second part of this study focused on the role of partnerships in ecosystem management and research. Beginning with the National Environmental Protection Act, broad based public

involvement has become an increasingly important element of natural resources management. Ecosystem management, however, brings citizens to the forefront of management planning, in new and more direct ways. The small number of articles specifically identified in our computer search of natural resources partnerships (Appendix 6) confirms the young state of scientific knowledge about these new forms of partnerships. However, their central role in ecosystem management is well acknowledged in recent land management agency materials, and, reports such as the Report of the Interagency Ecosystem Management Task Force on "The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies.". And indeed, both focus groups recognized collaboration as a priority research issue. Thus, although the importance of partnerships is now accepted, knowledge about how to initiate, implement and sustain successful partnerships is not well developed, nor is there a clear understanding of partnership outcomes. The objective of this portion of the study, therefore, was to identify important elements for ecosystem management partnerships and to assess partnership success and prospects for the future.

To gather partnership information, a survey was given to workshop participants, people who are currently identified as contacts for ecosystem management partnerships in Colorado, and a number of national leaders in ecosystem management (Appendix 7). This survey thus does not represent a scientific random sample, but views of active ecosystem management partners. A total of 48 surveys were completed; 9 from the Colorado Springs Workshop, 15

from Fort Collins, 24 from ecosystem partnerships throughout Colorado, and 3 from national leaders. Of the Colorado respondents, 35 respondents were with Federal government, 7 state government, 1 local government, 2 non-governmental organizations, and 1 private sector or industry.

Survey Results

Most respondent ecosystem management projects had been in existence one to three years. In terms of meeting project goals, 45% said their partnership has been successful, 44% indicated moderately successful, and 11% said it was neither successful or unsuccessful. Interestingly, no one thought their partnership had been either moderately unsuccessful or unsuccessful (Table 6).

Another question asked respondents, "what do you think are the most important elements for successful partnerships." The most critical factor identified in the surveys was the need to establish **common visions and goals**. (Table 7, Figure 1 and Appendix 8). Incorporating additional results, this vision should be **supported** in terms of people and funding and result in a **commitment** to work together for partnership objectives. Other important elements when implementing the partnership's shared vision and goals are strong **leadership** and **cooperation**. Cooperation emerges from empowerment, positive interpersonal relationships, getting beyond personal agendas and turfism" and shared decision-making. In addtion, groups must be **inclusive** of all interests, with open and constant **communication**. **Incentives** and recognizable **achievements** are other important partnership motivators. Finally, **trust and respect** among

partnership members is crucial to sustain the partnership.

The last survey question asked respondents, "what is your prediction for current and future ecosystem management partnerships?" Out of a total of 34 responses to this question, 28 were positive about the future of ecosystem management partnerships, 2 were not sure, and 3 were not optimistic. Specific comments included, "without it the job won't get done", "they will become more crucial as staff and budgets continue to shrink", and, "more and more... one agency/entity cannot do it alone". Those who were pessimistic mentioned, "a key to success of these projects is having a responsible individual or organization to keep the ball rolling. This takes money and in Congress... support for these projects is likely to go by the wayside", and, the "social and political system doesn't favor protection of ecosystems."

DISCUSSION

In the Colorado Front Range, increasing populations and concerns of urban centers are setting the direction for both ecosystem management and research. What people think and know about natural resources, how they use them, and the impacts resulting from that use, especially growing residential uses of land, are the critical driving forces facing resource managers and scientists. The Ecosystem Management Research Workshops identified many issues and research questions that need to be addressed in Colorado. The Ecosystem Science Research Panel concluded that these gaps in research are best addressed with a three part

research structure: Science-Based Assessments, Client-Based Research, and Basic Research. Survey results supported the important role of partnerships in ecosystem science and management and identified key elements of partnerships necessary for success. However, inherent in both ecosystem management and ecosystem science are a number of paradoxes that need to be addressed.

The Science Paradox

Sound science is fundamental to ecosystem management. Understanding the complexity of whole systems in varying degrees of scale with integration of both social and biological factors requires a higher level of knowledge than ever before. Additionally, managers, the public, and decision-makers need to have a greater understanding of the consequences of management and policy decisions on ecosystem health and productivity and on social communities. However, although ecosystem management calls for a stronger science base, we are witnessing a time when science is increasingly being scrutinized, its relevance intensively questioned, and its financial support substantially decreased.

The paradox facing ecosystem science -- increased need with decreased support--- may be more a product of the current political environment than a fundamental statement about the value of science. However, given the current political agenda of many decision-makers, it will be imperative that ecosystem management science maintains its standing as an important contributor to the national interest and welfare. As Clark and McCool (1985) concluded in their study of federal agencies, the reason for the

long-standing success of the Forest Service is its strong connection to an overriding public interest, specifically producing wood products for homes and other human uses. Today, decreasing timber harvests from public lands dramatically changes the mission and products of the U.S. Forest Service. Ecosystem management science focuses on production of healthy and sustainable ecosystems rather than the production of single outputs such as timber. This fundamental change in Forest Service mission is a response to changes in public values and needs. However, if the paradox of ecosystem science is to be resolved, management and science must be seen as relevant to the every day lives of people, especially those living in urban areas. Moving toward more client-based research is one step in this direction.

The Partnership Paradox

Creating partnerships that are inclusive and produce shared decisions is another way ecosystem management will become more relevant and understandable to the public and decision-makers. However issue identification workshops highlighted the fact that the concept of ecosystem management is not clearly defined or understood. Creating broad-based partnerships to identify important issue sets, to develop shared visions and goals, and to be "real" participants in project implementation, should enhance public understanding and acceptance of ecosystem management and science.

However, similar to science, a partnership paradox exists that can significantly affect the outcome of partnership projects. One

important component of partnerships identified by survey respondents was cooperation and shared decision-making. However, the critical role of strong leadership where responsibility is clearly identified also was suggested. One respondent noted, "too often ecosystem management partnerships try to distribute control but this is contrary to effective implementation of partnerships". Thus a partnership paradox emerges in ecosystem management research between the need for a traditional leader in control vs today's emphasis on empowering many to be in control. Most likely, the move toward more collaborative decision-making will continue, however the focus must be kept sharply on accountability and measurable products.

CONCLUSIONS

Change is occurring rapidly on all lands, public and private in Colorado. The Colorado Front Range is distinguished by its rapidly growing population, causing considerable concern about the impact of humans on the landscape. Concurrently, ecosystem management has evolved as the philosophy and process guiding public land management. Inherent in the ecosystem management philosophy is the importance of human values and needs, and of integrating both social and biological factors in ecosystem science. Although this human dimension has been incorporated in past management and science schemes, the centrality of these notions is at the basis of today's paradigm shift.

To help positively guide the change occurring in Colorado, a

process was initiated to identify major ecosystem management issues and to construct a model that incorporates these priority research needs and concerns. The model developed is a three-part approach to ecosystem management science: Science-Based Assessments, Client-Based Research and Basic Research. The appropriateness of these approaches will depend on the purposes, scope, scale, integration, and time-frame of a specific research question. In the Colorado Front Range, emphasis needs to be placed on producing client-based research that addresses priority ecosystem management and policy issues, especially those related to the impacts of population growth.

Critical to the success of both ecosystem research and management is the development of partnerships based on a shared vision of needs and objectives. Perhaps one of the most positive early outcomes of ecosystem management is the greatly increased coordination and understanding between managers and scientists. Including citizens, decision-makers, and interest groups will expand the partnership circle and ensure that research and management stay focused on issues of highest priority.

The paradox of science (increased need vs. decreased support) and the paradox of partnerships (leader in control vs partners empowered to control) contribute to uncertainty during this time of shifting paradigms and changing conditions for science, management and policy. Similar to ecosystem management, there is no one-size-fits-all approach for ecosystem science. However, developing broad frameworks for ecosystem management science based on constituent

needs and collaboration will ensure that research addresses issues of greatest importance and produces information that leads to the sustainability and health of both our natural and social communities.

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TABLES

Table 1

MAJOR ECOSYSTEM MANAGEMENT RESEARCH ISSUES

Fort Collins Workshop

Issues	Total Points Assigned*	No. of People Assigning Points to Issue
Data Needs	34	9
Sustainability	27	8
Population Growth	14	4
Collaborative Strategies	14	6
Public Understanding	10	3
Land Use Planning	8	3
Private Lands	8	3
Disturbance	7	3
Air Quality	4	2
Hydrology & Water Quality	4	2
Fragmentation	1	1
Historical Archaeology	3	1
Fire	5	2
Social/ Ecosystem Needs	2	1
Long-view/ Time & Space	3	1
What is an Ecosystem?	5	1
Institutional Culture	8	3
Sensitive Areas	0	0
Introductions/ Non-natives & Natives	0	0
Vertical Integration Wood Fiber	0	0

* Participants could assign a maximum of 5 points to an issue or distribute the points among up to 5 issues

Table 2

MAJOR ECOSYSTEM MANAGEMENT RESEARCH ISSUES

Colorado Springs Workshop

Issues	Total Points Assigned	No. of People Assigning Points to Issue
Education	38	10
Population Growth	32	9
Collaboration	30	10
Environmental Degradation	22	6
Mechanisms of EM	21	6
Environmental Management	16	6
Local Communities	12	6
Wildland/ Urban Interface	12	5
Research	10	6
Legal Issues	4	2
Humans & Nature	8	2
Risk Assessment	8	2
Planning Area Criteria	1	1
Conflicting Uses	1	1
Understanding Public Needs & Expectations	3	1
Recognize Cause Not Symptom	4	1
Recognition of Changing Systems	1	1
Learn from the Past	0	0
Conservation Reserve System	0	0
Systems Management	0	0
Exotic Species	0	0

* Participants could assign a maximum of 5 points to an issue or distribute the points among up to 5 issues

Ecosystem Management Research Panel
Priority Research Areas for Client-Based Research or Science Assessments

ECOLOGY

- Impact of reintroduction of indigenous species
- How to use range of natural variation
- Develop method to do disturbance based ecology given front range land ownership
- How to make decisions about minimum viable population levels
- What happens when you have too much wildlife disease
- Assessment of data availability

POPULATION IMPACTS

- Effects of development on water quality and hydrology
- Effects of alternative methods for wildlife hazards at the urban interface
- Impacts of fragmentation/subdivisions on wildlife, water
- Description of the front range - land use; habitat types; land ownership patterns; social values; legal/institutional structures
- Provide urban experiences as a land management tool-*?Meaning what?*
- Human health and environment

RECREATION

- Recreation impacts on timberline and high alpine areas
- Impacts of trails on riparian zones and how to mitigate
- Design and maintenance of facilities to accommodate ORV's (Off Road Vehicles) without degrading the ecosystems and given conflicts with other users

ECONOMIC

- Economic and other impacts of water conservation programs
- Economic benefits of non-commodity values

SOCIAL VALUES & INCENTIVES

- Identify community values/shared vision
- Identify user values, characteristics
- Identify incentives/tools for landowners to keep large tracks in tact

EDUCATION

- Design educational tools to help citizens develop relationship/awareness of natural world
- Evaluation of education systems in terms of natural sustainability values

POLICY

- Implications of nonregulatory mechanisms. How do they work; how to implement them; what are they
- How to build politicians into the research process?
- Design cost-effective, on-going social surveys
- How to make sure science is answering external questions

Table 4

Ecosystem Management Research Panel
Priority Research Areas for Basic Research

SUSTAINABILITY

- Carrying capacity
- What are the limits to a quality experience
- Are we reaching limits and how do we now
- Creation of a Colorado environmental index
- Are we exceeding sustainablility
- What kinds of impacts can be sustained

DATA NEEDS/METHODS

- Is our classification system correct? What does it tell us?
- What is the predictive value of habitat classification
- Do they address key questions
- Are they the appropriate level to be acting on (i.e., plant associations, if change one species do we get a different association?)
- Should we be looking at series level? What will each level tell us?
- How do classifications functionally fit together?
  i.e., food preferences developed by different people than plants association scientists
  i.e., gap analysis does not include fish, invertebrates, plants
- How to do large experiments that mimic large disturbances

WATER

- Standardization of ground water monitoring to provide long term trends
- Role of water in ecological integrity - how much water does it take in what pattern?
- Are there ways to mimic water patterns that include human intervention and beyond natural variability?

SOCIAL SCIENCE

- Building models ;for successful collaboration
- Effect of information on attitudes and values
- Basic understanding of public attitudes and values

Table 5

LENGTH OF PARTNERSHIPS

Survey	<1 year	1-3 yrs	3-5 yrs	5-10 yrs	10+ yrs	# Unknown
Colorado Mail	4	15	3	5		
EM 1/ Ft. Collins	4	10	5	1	1	2
EM2/ Colorado Springs	1	10	2	2	2	1
Total	9	35	10	8	3	3

* Number of partnerships are greater than the number of respondents because of respondent involvement in multiple partnerships.

Table 6

SUCCESS OF PARTNERSHIPS IN TERMS OF MEETING ITS GOALS

Survey	# Successful	# Moderately Successful	# Neither	# Moderately Unuccessful	# Unuccessful
Colorado Mail	15	11	1	0	0
EM 1/ Ft. Collins	4	13	4	0	0
EM2/ Colorado Springs	10	4	2	0	0
Total	29	28	7	0	0

* Number of partnerships are greater than the number of respondents because of respondent involvement in multiple partnerships.

Table 7

ELEMENTS OF PARTNERSHIP SUCCESS

Survey	Commitment	Common Goal & Vision	Leadership	Support	Cooperation	Communication	Trust & Respect	Inclusive	Incentives & Achievements
CO Mail Surveys	10	9	6	10	10	4	5	7	4
EM Workshop 1	7	5	4	6	2	1	0	1	0
EM Workshop 2	1	7	3	3	5	3	1	3	4
Total	18	21	13	19	17	8	6	11	8

FIGURE

Elements of Partnership Success

Figure 1

APPENDICES

FRONT RANGE ECOSYSTEM MANAGEMENT WORKSHOP
Fort Collins, CO
October 12, 1994

Workshop participants identified the following priority Ecosystem Management (EM) research issues. Listed under each issue are specific items mentioned by participants. The numbers in parenthesis are the points assigned by each individual to that topic. (Each participant was given 5 points to distribute according to his or her perception of an issue's importance. Thus, one could assign all 5 points to one item or distribute points among as many as five items.

MAJOR RESEARCH ISSUES

I. Population Growth (5,4,4,1) - Population pressure & trends/ conflicts/ uses/ sprawl/ growth

- Increasing Population/ Growth-Pressure on basic resources (water quality, air quality, habitat)
- Urban/ rural lifestyle conflicts
- Determine how type, pattern, and intensity of various human uses affects ecosystem function.
- Urban sprawl-private house building in/ near forest

II. Sustainability (5,3,2,3,4,1,5,4)

- How do we identify sustainability issues and at what point are we going against maintenance of Natural Systems? How can we manage natural systems?
- Lack of commitment to long term sustainablilty in meeting short term objectives
- Social needs/ wants/ trends

III. Air Quality (2,2)

- Air Quality
- Tradition of extractive uses

IV. Data Needs - Lack of knowledge, predictability **(4,5,1,5,5,5,2,4,3)**

- Lack of knowledge/predictability for physical, biological, social, and economic systems in place in Front Range and related trends.
- Define attributes of properly functioning ecosystem-composition, structure, process, interactive dynamics.
- Inability to predict forest succession in managed and unmanaged areas.
- Develop models to link social systems for the purposes of predicting management effects and information gaps.
- Lack of commitment to long term monitoring and evaluation.

V. Lack of Public Understanding/ Knowledge (5,3,2)

- Inability to resolve conflicting information or data
- Natural disturbance events/human intervention/values/perceptions/illusions

VI. Disturbance (4,1,2)

- Fire/people conflict
- Forest Protection: 1) Fire management-insurance
  2) Pest management-role of pest/disturbance, gypsy moth
- Natural disturbance events/human intervention/values/perceptions/illusions

VII. Sensitive Areas

- Recreational impacts on timberline and alpine areas-motorized, non-motorized/ wilderness, non-wilderness
- Lack of knowledge about regeneration areas-timberline and alpine

VIII. Collaborative Strategies (1,1,4,4,1,3)

- Need to work collaboratively with local governments to understand economic, social, and environmental trade-offs
- Need for collaborative strategies in interface that incorporate all resources
- How to make developers and owners in urban/ wildlands interface aware of hazards and self-responsibility
- NIMBY-Not In My Back Yard

IX. Introductions

- Introduction of non-native species, especially vegetation
- Reintroduction of non-present indigenous species

X. Hydrology and Water Quality (2,2)

- Effects of development on hydrology and water quality

XI. Historical Archaeology (3)

- Knowledge about management of historical and archaeological properties
- Native American religious sites and heritage- how to manage

XII. Private Lands (3,4,1)

- Identification of resources outside public lands that are needed to manage public lands for purposes for which they were established

XIII. Land-use Planning (4,1,3)

- Sound land-use planning
- Complex patterns of land ownership

XIV. Fragmentation (1)

- Fragmentation of habitat, ie artificial barriers

XV. Fire (3, 2)

- Effect of fire suppression on forests

XVI. Social/ Ecosystem Needs (2)

- Within concept of ecosystem management, how much weight given to human uses and desires and how much to components of ecosystem.
- Balancing desires of humans with ecosystem needs to achieve sustainability: identify carrying capacity

XVII. Long-view/ Big Picture (Time & Space) (3)

- Lack of broad view context in formulating management and development strategies at local and site specific levels

XVIII. Vertical Integration Wood Fiber

- Vertical integration of wood fiber to market products

XIX. What is an Ecosystem? (5)

XX. Lip Service-Institutional Culture (2,5,1)

- How to give more than lip service to non-government partners re: issues and solutions

* Rank given by participants to individual issues, 5 being the most important.

FRONT RANGE ECOSYSTEM MANAGEMENT WORKSHOP
Colorado Springs
October 27, 1994

Workshop participants identified the following priority Ecosystem Management (EM) research issues. Listed under each issue are specific items mentioned by participants. The numbers in parenthesis are the points assigned by each individual to that topic. (Each participant was given 5 points to distribute according to his or her perception of an issue's importance. Thus, one could assign all 5 points to one item or distribute points among as many as five items.

MAJOR RESEARCH ISSUES

I. EDUCATION (2,5,4,5,5,3,5,4,2,3)

- Sifting out fact from fiction so citizens can make informed decisions
- Average citizen not knowing how ecosystems work. Not understanding idea of greater good.
- Rechannel education $ and effort to "common man"
- Miscommunication and misconceptions about EM
- Urban public and officials need basic understanding of natural resources
- Make complex EM issues simple and understandable. Define most important
- Greater emphasis of environmental education in private and public schools
- Need better education about system complexity and personal stewardship

II. COLLABORATION (3,4,5,3,1,3,4,2,1,4)

- Conflict between agencies - lack of cooperation at state/ federal/local levels. Different visions
- Forums approach management holistically, whereas management happens by each group looking at their individual part. Mechanisms are short sighted
- One entity doesn't know about what others are doing in a coordinated way
- No EM management leadership because so many groups, scales. Frustrating to implement, less becoming accomplished. Need identifiable leadership group.
- Need fiscal flexibility with other agencies and groups
- Reinvention -- existing structure of government and regulation confusing and don't accomplish goals

III. POPULATION GROWTH/ PRESSURE (4,3,5,3,4,3,5,4,1)

- Rapid, unrestricted, unplanned growth and impacts on urban interface
- Human population demand on resource
- Pikes Peak ecosystem in a mess. Not Unconscious growth. Poorly planned development
- Open space, air quality, wetlands, need to part of planning
- Overpopulation

IV. RESEARCH (2,1,2,1,2,2)

- Linking research and management
- Research needs to be more focused and prioritized
- Research too slow. Sometimes need protection before have research. Conflict between science process and rate of environmental degradation
- What is the role of artist, poet, storyteller in research
- Need greater acceptance of what research is telling us. When is enough information enough
- Confusion because of research support of different points of view

V. LOCAL COMMUNITIES (1,2,2,1,4,2)

- More exploration of community economics and community designs for sustainability
- Sustainability of rural communities and quality of life --how to sustain communities social and physical fabric. How not to isolate communities
- EM too large a concept. Need to look at interests and management of local communities so people can identify with ecosystems
- Need ways to focus on economic impacts of EM on communities
- How to define natural processes, range of natural variability

VI. ENVIRONMENTAL MANAGEMENT (2,2,2,4,3,3)

- Information regarding water depletion impacts on aquatic ecosystems
- Make sure cultural resource management part of EM. Break down distinction between nature, landscapes and culture.
- Reevaluation of T&E program
- Water quality and quantity. Transmountain diversions - Water coming from outside region. Effects of commodity uses on water quality
- How to define natural processes, range of natural variability

VII. WILDLAND/URBAN INTERFACE (5,2,1,1,3)

- Forest health and urban interface (vegetation, fire)
- Wildland urban interface relating to wildlife, safety, trespass (building knowingly or unknowingly on public lands)

VIII. ENVIRONMENTAL DEGRADATION (1,5,4,5,5,2)

- Watershed management
- Land fill fees -- need to reverse incentives
- Human pressure on remaining large tracts. Habitat fragmentation. Pressure to open more trails. Impact on large predators
- Erosion, sedimentation problems
- Air quality

IX. MECHANISMS OF EM (1,4,5,4,2,5)

- Managing systems, not species -- landscape design across agencies
- New common vision reflecting views of local constituencies and larger public interests. Need vision process.
- Strong single focus agencies that have upper hand and act above the law
- Agencies need public involvement and FACA prevents it
- Recognizing EM is a social process, how do we bring government and citizens together to develop common goals/vision and solve problems. How to get "buy in"
- Need to ask for, use citizen expertise

X. LEGAL ISSUES (3,1)

- Private property rights v. public good

XI. HUMANS AND NATURE (3,5)

- Understanding humans are a part of nature not above it

XII. RISK ASSESSMENT (3,5)

- How to assess risk

XIII. PLANNING AREA CRITERIA (1)

- Need criteria for setting up areas that relate to EM - areas that function as a unit

XIV. CONFLICTING USES (1)

- Conflicting uses, i.e., grazing and recreation

XV. UNDERSTANDING PUBLIC NEEDS/EXPECTATIONS (3)

- No current understanding of changing needs and expectations of public regarding wildlands (public and private)

XVI. LEARN FROM PAST

- Don't throw out the past -- learn from it

XVII. RECOGNIZE CAUSE NOT SYMPTOM (4)

- Look at causes not symptoms

XVIII. CONSERVATION RESERVE SYSTEM

- Conservation reserve program -- impacts of putting land back into production

XIX. SYSTEMS MANAGEMENT

- Need system management rather than micro management

XX. RECOGNITION OF CHANGING SYSTEMS (1)

- "Temporal myopia" - recognition that system has changed and will change

XXI. EXOTIC SPECIES

- Exotic species - how to deal with them in ecosystem context

Appendix 3

FRONT RANGE ECOSYSTEM MANAGEMENT WORKSHOP
Fort Collins, CO
October 12,1994

RESEARCH NEEDS

Specific knowledge gaps identified by participants in relation to a number of priority research issues.

Population Growth

- How to relate classical economics with other demographic and social science analysis.
- What is optimal shaping of location of communities in order to preserve corridors and connections between habitats?
- How can zoning be used as an ecosystem management tool?
- How will agency limitations of use on public lands affect private economic development and land use?
- In what type of areas should use be restricted until impact data is available for sensitive areas?
- What are components of and how to create healthy mountain ecosystems?
- What is importance of rural areas and rural lifestyles on the Front Range (contribution to economy and quality of life)?
- What are the limits to growth for Front Range watersheds and what are trade-offs?
- Case studies of other communities/comparative analysis with Utah's Front Range.
- Study effects of development on ground water table, hydrology, water quality.
- Long term demographic projections and specific population distribution forecasts based on individual community plans and objectives.
- What are ecosystems benefits of cluster vs. dispersed mountain developments?.
- Identify demographic data sets held by census bureau and identify collaborative research effects by agencies and census bureau.
- FEMA assessments of populations at risk.
- Study patterns of forest use by various ethnic and social groups.
- Develop graphic depictions of mountain density over 25 year intervals.
- Need for strategies for managing growth.
- Assess differentiated effects of extractive renewable and non•renewable resources.
- Assess need for stricter regulations to protect forest.
- Literature search of recreational impact to back country.

Data Needs

- Ability to predict forest succession under alternative management strategies where management could include no management.
- Develop broad-based program to address over all needs.(ie design project that assess technological tools to address information needs of agencies- federal/ state/ local)
- More data on climate changes improving measurement and recording of weather variables including air quality.

Appendix 3

Data Needs

- What is economic contribution to healthy ecosystem to Front Range communities?.
- Long term empirical studies on snags and dead woody materials.
- Develop predictive modeling capability for ecosystem managers.
- Models of past human uses.
- Include uncertainty analysis in predictive modeling.
- Development of expert(experimental) systems.
- Regenerative capacity of timberline and alpine.
- Develop software for analysis of remote sensing data.
- How to communicate data to public.
- Information about natural variation.
- What is adequate amount of data needed to make reasonable decision?
- Where are the "train-wrecks"on the Front Range? Where are unique species/ habitats?
- What does the silent majority of citizens want from forest ecosystems?
- Improved biological mapping.
- Integrated approaches focusing on linkages biophysical and social.
- Assess process dynamics of ecosystem.
- Decision, planning, permit processes re-evaluated so monitoring and evaluating is part of basic planning.
- Greater use of no-equilibrium models.
- Define the specifics of our natural functioning ecosystems.
- What scales/ levels are necessary to define context and characterize ecosystems?.
- What are most endangered ecosystems rankings?.
- What and how to monitor and for what purpose-ecological and social.
- Assessment evaluation of beliefs, attitudes, values, behaviors, desires for ecosystems.
- Bridge gap between research and what actually happens on the ground.
- Evaluate present management techniques.

Collaboration Strategies

- Develop PR tool(ie Smokey Bear) for developers, local governments, and interface owners.
- Identify spacial context of human influence on landscape -how far out do you go to get information about decisions?. What is the constituency range?.
- Identify information and data needs and availablilty of federal/state/local agencies--similarities and differences.
- What laws, regulations, and zonings work?
- Need visual urban forest interface models that the public can use.
- How to link community strategic planning and desired future with public land planning.
- Develop uniform data attributes for ecosystem management that can be used by federal/state/local agencies.
- Attributes need to focus on broad, mid, or local scale.
- Recruit private sector citizens on problem solving teams.
- Develop cost effective techniques to educate interface owners about hazards.
- What environmental, economic, social, information is critical to help communities think strategically about ecosystem management.

Appendix 3

Collaboration Strategies

- Continued development of software/technology (ie Terra Lab) for facilitating rational discussion among opposing lab.
- Document qualitative and quantitative development impacts county by county.
- Single model project of cooperation to inspire others= " a quick victory".
- Resource inventory on private lands.
- Consistent and shared data and information bases.
- Analysis of cultural and legal barriers to collaboration.

Sustainability Needs

- Measures of central tendencies.
- Develop restoration techniques for degraded systems.
- How do we change views of social needs and wants to incorporate maintenance of natural systems?.
- How much natural disturbance from urban interface to wilderness. What are appropriate levels?
- New math: RNV + 2-3 million humanoids=RNV + 260 humanoids, solve for RNV
- Develop public education program.
- What is role of local governments in sustainability?
- Assess effects of friendly visitation.
- What is relationship between desired future conditions and sustainability?
- Ways of identifying consequences of operating outside range of natural variability.
- Psychological, social, political, evaluation of institutional barriers to sustainablity.
- Identify what components , structures, and processes needed to perpetuate ecosystem.
- Identify human needs that can be provided.
- Determine how ecosystem changes when excessive demands are placed on it.
- Relationship between sustainablilty and self-sustaining.
- Where and when should there be self-sustaining ecosystem.
- What constitutes degradation of ecosystems(perception, natural disturbance OK, man-caused bad)
- Range of natural variability.
- For cultural resources, define levels of acceptable loss.
- Where can energy impact be used to enhance likelihood of sustainablilty?.
- What are the components of sustainability.
- Devise attributes needed to gauge sustainability.
- Decide whether we want to encourage the maximum preservation of threatened species or equilibrium.
- Define economics and resource trade-offs when sustaining one ecosystem component or another.
- What does renewable resources mean in the context of sustainable ecosystems.
- What is the carrying capacity of Front Range?. What are the physical limits and what are the costs at that level to the ecosystem?.
- Focus on soil component.

FRONT RANGE ECOSYSTEM MANAGEMENT WORKSHOP
Colorado Springs
October 27, 1994

RESEARCH NEEDS

Specific knowledge gaps identified by participants in relation to a number of priority research issues.

Environmental Management, Wildland/ Urban Interface and Degradation.

- Prioritize what activities and resources are most important. Can't do everything
- Assess effects of air pollution from various sources
- How to change forests back into healthy ecosystems
- How long can artificial communities be sustained
- Better understanding of human component of Colorado Front Range
- What are values of communities. What are common social units
- Identify big picture, integrated approach for development
- Identify cumulative effects of development especially on watersheds
- Develop protocols and methodologies to measure environmental values at risk (i.e., sediment impacts)
- Identify effective analysis for monitoring. What will buy us the most
- Identification of environmental processes, functions, interactions at various scales
- Need common environmental classifications across agencies
- Identification of environmental conditions as they are today
- Identification of restoration potential
- Identify landscape design for Front Range to ensure long term integrity of communities
- Distinguish between long term and short term effects
- Identify environmental consequences of development
- Establish EM plan identifying maximum and minimum best management practices
- Broader research toward whole systems instead of individual species
- Redefine research process -- change acceptable paradigms
- What are social, economic, biological functions of open space
- What are the effects of water flow fluctuations (diversions, timing of release, etc.)

Education Research

- Investigation of more participatory/experiential learning -- what makes sense to young students
- What forms of communication of most effective in getting message across to various publics?
- Why EM - what is wrong with way we are doing things now?
- Knowledge regarding how to change people's behavior

Education Research

- Simplification of information
- Common definitions and understanding of EM
- What is relationship between simplistic and comprehensive concepts
- Identify storage place or means to facilitate information sharing
- Develop Ecosystem curriculum beginning with elementary school
- Monitoring programs and techniques
- Develop simple models
- Develop "real" information/channels to bridge gap between bureaucracy and citizens
- Research to establish objectivity of work
- Develop information about individual/citizen advocacy
- What is best age group to focus on with limited $'s. Where do we do the most good (demographics, age, cultural)
- Universities develop EM concepts taking an integrated approach
- Reevaluate curriculum -- more social science
- Develop environmental programs for all public
- Focus university classes on outside, real problems
- Look at successes of changing behavior -- How do they work
- Explore ways to use EM to teach basic science

Population Growth

- How to solve ethical dilemmas
- Should we as a society support family limits, population policies, etc.
- Effects of marketing Colorado's tourism on population growth
- Effects of prescribed fires on urban interface
- Assess methods of irrigation and water use. Investigate different vegetation impacts on water use
- How to encourage in-filling of urban areas
- How to make conservation/recycling more acceptable/accessible/ economical
- What should we be recycling. What are consequences of different methods
- How to reuse materials
- Develop guidelines for local communities to help them manage and control growth
- Identify incentives for landowners to keep large blocs of land intact
- Effects of growth on groundwater (contamination and quantity)
- Develop more energy efficient ways to provide power
- Powerlines & transmission lines effects on people
- Develop cost-share opportunities between cities and agriculture user

Collaboration

- Create clearinghouse
- Standardize language, methods to collect information
- Identify successful EM models
- Create/identify regional models

Collaboration

- Develop collaborative methodologies at local level in line with FACA
- Identify ways to blur jurisdictional boundaries
- Remove institutional barriers to EM
- Identify ways to entice private sector toward collaborative approaches
- Make regulatory agencies more user friendly
- Common display of resource information (GIS)
- Develop channels for agencies to communicate with one another
- Implement mechanisms for citizen groups to work with agencies
- Develop leadership models, skills, for EM
- Universities take lead for EM leadership in information sharing
- What is the leadership role of different groups
- Use university as holder of funds to cross institutional lines
- Evaluate laws/regulations v. what manual says has to be done
- How to find/restore trust in professionals
- Create EM mission statement
- Establish yearly conference to exchange goals and priorities
- Identify/understand what we want, know from different ecosystems
- Establish demonstration projects to break down barriers. Start from ground up with no constraints.

COLORADO FRONT RANGE ECOSYSTEM RESEARCHERS WORKSHOP
November 10,1994
Fort Collins, CO

Task #1: **Design a Colorado Front Range Ecosystem Research and Knowledge Delivery System.**

Group #1
See Group #1 Figure

Group #2
See Group #2 Figure

Group #3
Ecosystem Management in a policy context requires an understanding of integrity of the natural ecosystem. We need to know:

1) System Function/ Structure before determining integrity.

2) Recognize resource outputs are by-products/consequences of system structure/function.

3) Recognize the system boundaries are not political, but are determined by structure and are "soft/fuzzy". Respond to changes in adjacent and/or larger systems.

4) Recognize that humans are part of the structure/functions of system in addition to managing the system.

5) The resource "outputs" are the supplies that are altered by the societal demands. These demands are Value Driven.

Therefore, the research should focus on the function and structure of the system before focusing on specific outputs.

1) This requires interdisciplinary studies of system functions/structures at "appropriate scales" as illustrated in catchments of increasing size that relate to specific management goals.

2) Avoid "one size fits all" approaches to system definition.

Group #3 cont'd

3) To establish research priorities focus on those structures and processes that are unique to front range and currently limited or exceeding the limited capacity or the system to process. By "process" we include all abiotic and biotic processes from the hydrologic cycling to nutrient cycling (eg nitrogen, carbon)

4) Identify and assess existing data sets
   a) long-term
   b) spacial/linkage
   c) short-term

5) Sustain the funding basis for integrated data collections and analysis. Institutionalize ecosystem approach.

6) Relate Value-Systems and Demands for resources into decisions on both scientifically appropriate scales and societally recognized useful scales to define system boundaries and research sites.

7) Simultaneously recognize research needs in social sciences that focus on changing societal values--Does the public agree with "one solution"? Or how can we better resolve conflicts over "alternative solutions"?

8) Incorporate "feedbacks" from social science based studies.

Task #2: Identify Specific Front Range Research Projects Needed to Implement Design

Group #1
Social & Demographic Trends

1) Document past and future trends in development.

2 Study land use and development patterns/land ownership on private lands adjacent to/within public lands.

3) Evaluate the increasing pressure on public lands.

Group #1, Task #2

4) Survey the public opinions for future land use.
   - Recreation
   - Open space reserves
   - Urbanization
   - Extractive/exploitive uses

5) Identify legal constraints.

Biological

1) Defining the EM Area.

2) Identifying the sensitive components.

3) Identifying acceptable levels of extraction of resources while maintaining integrity of system.

4) Defining sustainability at various spacial and temporal scales.
   - Evaluating alternative strategies for resource extraction or utilization.
   - Evaluating affects of various landscape patterns (fragmentation & connectivity)

5) Estimating RNV (Range of Natural Variability)

Physical

1) Determine RNV
   - Climatic
   - Ground water
   - Fire (disturbances)

2) Identify commercially and recreationally valuable resources.

3) Evaluating potential water development projects.

*IMPLEMENTATION

Group #2

Outdoor Recreation

1) Impacts on natural resources.

2) Human dimensions of recreation between types and between land managers and recreationists.

Appendix 5

Group #2, Task #2

Public/Private Land Interface

1) Local scale
   - Houses, cats, dogs, exotic plants

2) Regional scale
   - Nitrogen transport
   - Water transfer

3) Shift of ???

4) Human dimensions
   - Public land managers
   - Private land owners
   - Fire

Disturbance

1) Scales of disturbances

2) Forces driving disturbance - ?? fire

3) Human dimensions of disturbances-Public's willingness to tolerate disturbances

Agriculture

1) Water and land banks.

2) Is there a rule for agriculture in urbanizing landscapes?

3) Economics of agriculture incentives.

Urbanization

1) Costs to society of unplanned development.

2) Limits to growth.

3) Trade-offs between growth in rural vs urban interface.

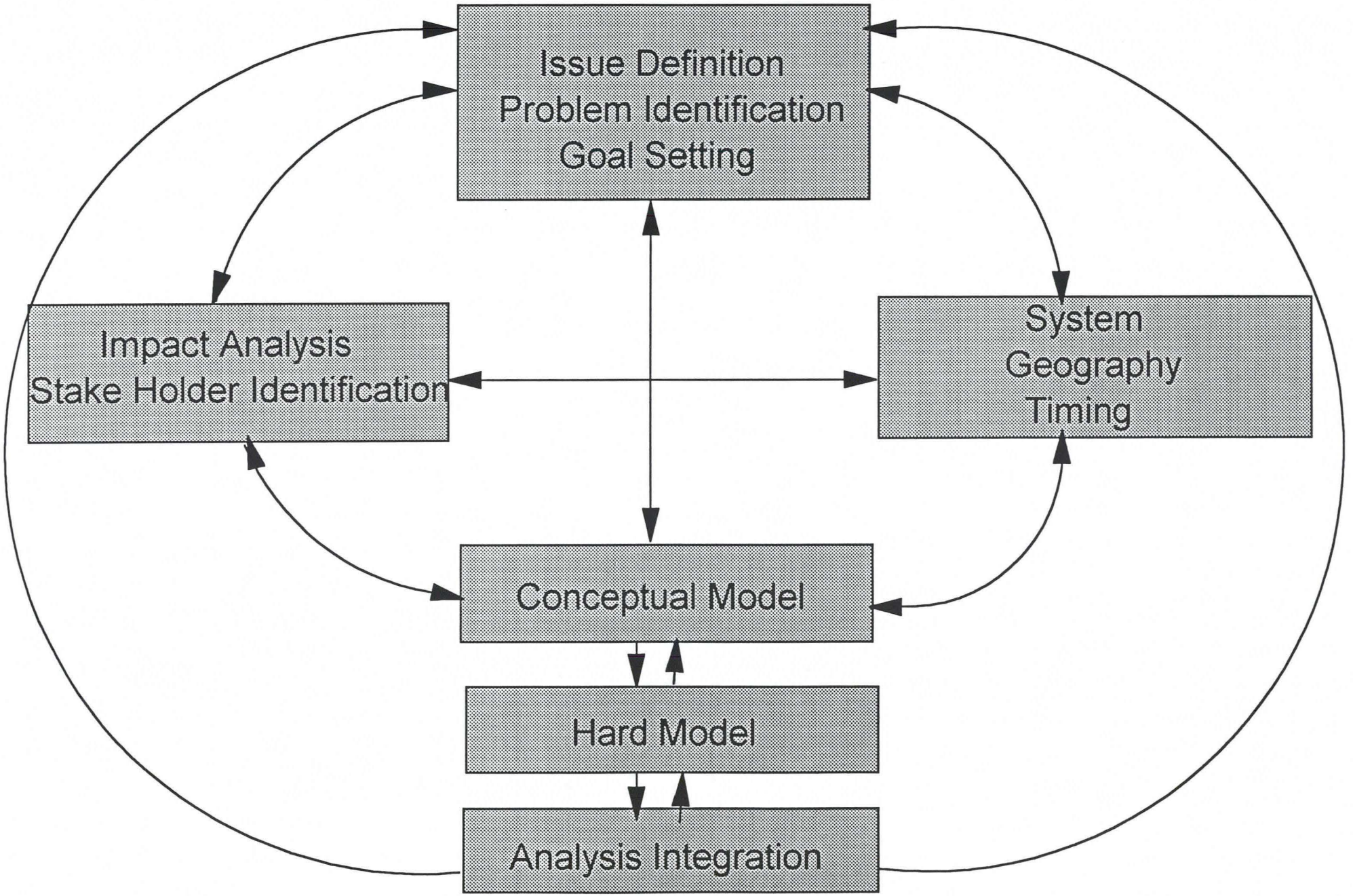
4) Economic costs of growth.

Group #3

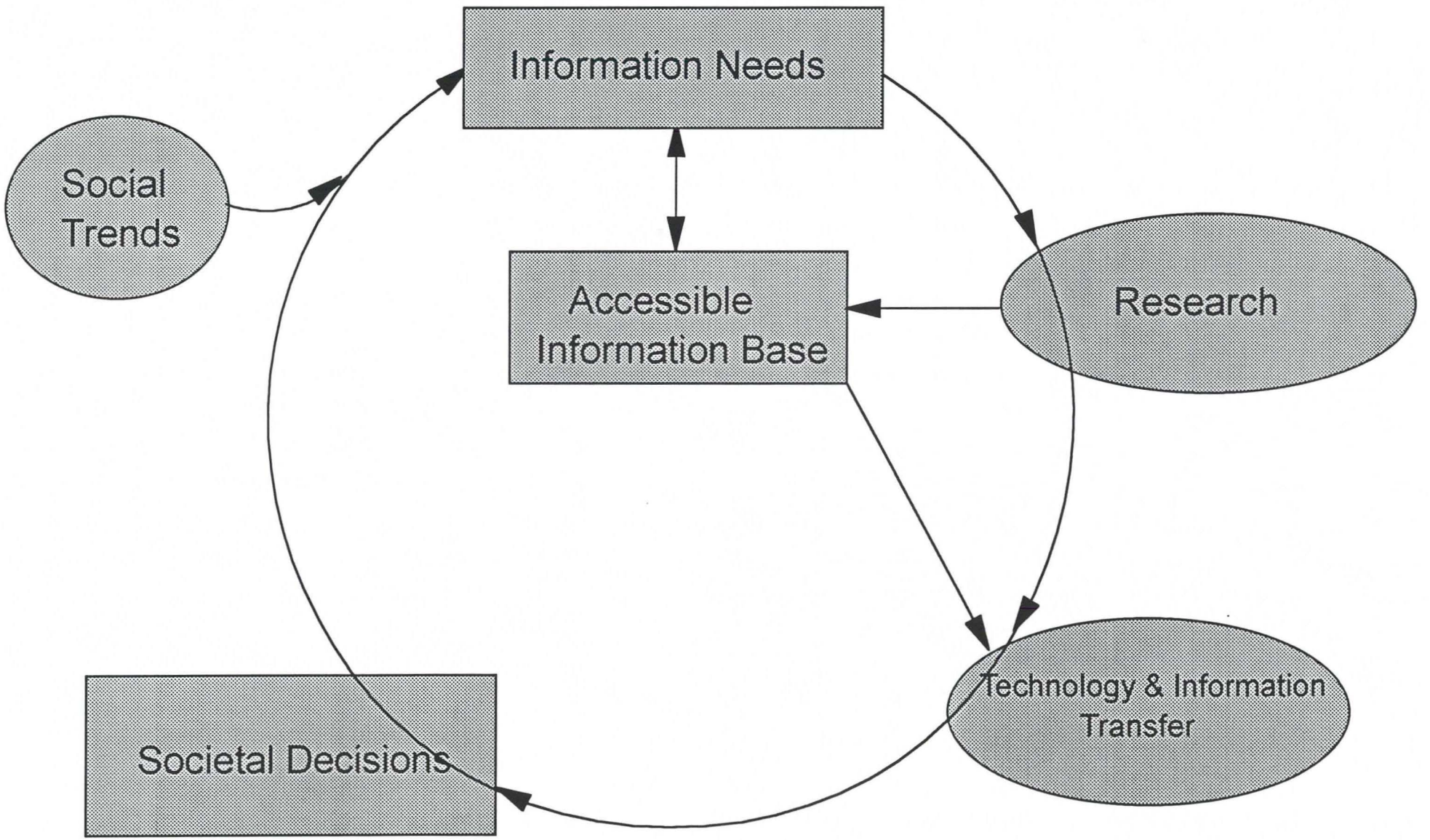
Assess status and historical trends of comparable systems as means of determining rates of change and also interpreting general system dynamics for evaluating alternative management scenarios and consequences.

- Avoid institutionalizing science
- What happens over long periods of time?
- What are the "best 5 management practices?
- Manager needs to manage the system structure and functions.
- Is the population of species _____ sufficient to maintain itself?
- The whole decision system is far more complex than just FS managers.
- Sign posts from(to?) different states of degradation.
- Issue of value of historical data.

Group 2


Issue Definition
Problem Identification
Goal Setting
Impact Analysis
Stake Holder Identification
System
Geography
Timing
Conceptual Model
Hard Model
Analysis Integration

Group 1


Information Needs
Social Trends
Accessible Information Base
Research
Technology & Information Transfer
Societal Decisions

LITERATURE REVIEW METHODS

A computer search was conducted on Ecosystem Management Partnerships using the following key words: coordinated management, ecosystem management, integrated management, partnerships, conservation partnerships, and other combinations of words which could possibly have anything to do with partnerships and resource management. The findings were few. Throughout the review much of the literature had some mention of partnerships, coordinated management, interagency cooperation, etc. However, only fourteen articles and two books were selected for the literature review summary, although many others mentioned partnerships superficially.

Summary of Selected Literature

Partnerships--Making Them Work in Times of Limited Resources

Glenn A. Carowan, Jr.
Fire Management Notes. Volumes 53-54, No. 2. 1992-3. pages 23-24

Department budgets have been slashed, staff reduced and procurement of equipment suspended while wildland fire problems have been increasing. The challenge is to provide the same services and more with less funding. The success of some agencies is attributed to partnerships.

> "These partnerships will not only generate the political clout and justification to continue the excellent job that the public has come to expect, but will also allow better and more efficient use of limited resources in times of tight budgets."

At a Comprehensive Fire Planning Workshop held by the Maryland Public Land's Forestry Division and the FWS, the public, representatives from local and state governments, elected officials, federal and state resource agencies, and private industry unanimously agreed that interagency-industry partnerships must be developed in order to provide the best resource management possible at the least cost.

Specific objectives were defined at the workshop:

- Enhance relations between cooperating agencies and participating forest product companies.
- Determine the status of current and future programs and activities, preparedness, and equipment.
- Develop a complete fire management plan that addresses how to cooperatively reach goals with combined resources.

"When budgets are tight, one alternative is to forge partnerships that capitalize on the

consolidation of available equipment, pooling of resources, and collaboration of government and business." Wasteful duplication is being eliminated through communication and planning by all players. Everyone has benefitted from the teamwork that has helped Delmarva jurisdiction overcome the lack of fire suppression and presuppression resources.

A research-management partnership

David Tippets
Forestry Research West. Oct., 1993. pages 11-15

Research at the Northern Region's Intermountain Station Research illustrates a new approach being taken to link science and management. Traditionally the region has used an ecosystem-state inventory. Now it has an ecosystem-process/ function inventory. The station realized that the need for basic data and the methods and tools to make them useful to managers is fundamental to making ecosystem management work. The Ecological Science Committee comprised of agency and university scientists was formed to tackle to objectives:

1) To help managers design monitoring and inventory systems.

2) To help managers develop strategies to that conserve ecosystem processes, functions, and provide for ecosystem health and sustainability.

The close cooperation between researchers and managers exemplifies the adaptive management strategy which many believe to be necessary for the success of ecosystem management.

A National Framework: Ecosystem Management
4 Fundamental Principles to Guide the Implementation of Ecosystem Management

USDA/FS Publication April 1994

The Forest Service has defined 4 guiding principles to follow in implementing ecosystem management:

- Ecological Approach
- Participation
- Scientific Knowledge
- **Partnerships**

"Ecosystem management requires continuing cooperation among varied public interests, land managers, land users biologists, foresters hydrologists, economists, engineers, sociologists, botanists, geologists, scientists, technicians, and other professionals. Ecosystems cross jurisdictional lines, making the need for cooperation, coordination, and partnerships great."

Sharing the Commitment: Partnerships for Wildlife, Fish, and Rare Plants on the National Forests

USDA/FS Government Document May 1991

This is an informational publication highlighting Forest Service partnership programs. In 1986 when Congress established the Challenge Cost-share program (in which State and private sectors share in management and costs of Federal habitat improvement programs), it started with 57 partnerships. By 1990, the idea had spread to more than 1700 partnerships. Partnerships are cost effective and offer citizens opportunities to become involved in habitat enhancement projects. This publication spotlights three FS partnership programs: Get Wild, Rise to the Future, and Every Species Counts.

A Conservation Partnership Sets the Standards

Donald L. Basinger

Our American Land. 1987 Yearbook of Agriculture U.S. Government Printing Office. pages 276-80

"A Federal-State-Local partnership must be established and maintained to manage the Nation's soil and water resources....The 1985 Food Security Act and the Clean Water Act of 1987 present opportunities for Federal-State-local cooperation on soil and water conservation projects, including some dealing with nonpoint source pollution control." Over the years through extension and use of voluntary standards, SCS has been the facilitator of change towards better management practices. Farmers and the land have benefitted from the technical training provided by SCS. These partnerships have led to better conservation standards in the field and industry. Because of reduced federal workforce, the USDA will necessarily involve more people in their soil and water conservation projects.

Barriers to Effective Public Interaction

Arthur W. Magill

Journal of Forestry. v 89, no. 10. Oct. 1991 pages 16-18

Resource managers need to be well-rounded individuals with good interpersonal and communication skills. There are attitude problems that create the gap between managers and the public. (we know best, above politics, esoteric language, different values and ethics) However, attitudes are changing as is evidenced by the growing participation of the FS in partnership that are directed towards working with and serving people. Problems that have no correct solutions, the persistent "change them, not" attitude, and a decline in interest in social problems by science students since the 1960s stand in the way of reform. Having universities require social, political and communication science courses in their natural resource curricula would be a positive direction. Old goals, values, and perceptions must be changed. The openness to change can be created through research and training.

Building Partnerships for Ecosystem Management on Mixed Ownership Landscapes

V. Alaric Sample
Journal of Forestry v 92, no. 8 August 1994. pages 41-44

Ecosystem management must be done on the landscape scale in order to maintain biodiversity and water quality. However, existing political boundaries do not follow ecological boundaries. Complicating the situation even more is the intermingling of private and public lands. Private land holdings are much greater than public ones. Thus, private lands will play a critical role in ecosystem management. Management strategies must recognize and accommodate appropriate economic and other goals of the private owner. As the public becomes more aware and concerned with forest conservation, there will be more pressure for government regulations. However, regulations are expensive to comply with and when they reduce land values or an owner's income their constitutionality is questioned. Before more government regulation is implemented, nonregulatory options should be considered. Incentives such as tax benefits or penalties, educational and technical assistance, and building understanding and goodwill through publicity are examples of ways to facilitate cooperation and protection. The government's role will best be played as a catalyst. Technical assistance has been identified as the area in which most land owners are interested. Limiting of decision making flexibility is a concern held by both public land managers and private landowners when entering into a cooperative planning effort. Federal antitrust laws are a major barrier cited by corporate forest landowners. These problems must be overcome if the goals of ecosystem management are to be achieved.

Organizational and Legal Challenges for Ecosystem Management

Errol E. Meidinger
Draft No. 3, May 4, 1995. University of Washington Law School and Institute for Environmental Studies

Federal land management agencies have sufficient authority in their mandates to pursue ecosystem management on federal lands, however, nontrivial obstacles exist that will impede successful implementation of ecosystem management. There will be difficulties in management of private lands where the government has less authority to do so and difficulties within in the government itself. In general, laws have been giving agencies more autonomy, but the federal government needs to work on providing public dialogue. FACA (Federal Advisory Committee Act), which focuses on continuing relationships between agencies and nongovernmental organizations, and its consequences are discussed. Its noble intentions are derailed by over-regulation. The relevancy of antitrust laws is also examined. They could prove to be an obstruction, but certain factors also exist that decrease the risk. Implementing ecosystem management will not be easy and will require creative management on the part of the managers working within and on the edges of the existing organizational and legal structure.

An Environmental Profile of the Greater Yellowstone Ecosystem Executive Summary

Dennis Glick
Greater Yellowstone Coalition. Bozeman, MT, 1991

This summary gives a brief overview of what the Greater Yellowstone Ecosystem (GYE) is. The ecosystem is described as a "seamless, intricate web of life." Biodiversity is defined as "the diversity of life in all its forms and at all levels, including diversity of species, landscape, habitats, and genes." The challenge of how GYE will protect and sustain its ecosystem and manage human uses of all its resources is being confronted. Communities in the area realize that their quality of life and economic sustainability is dependent on the Yellowstone Ecosystem. Some economies are slowly moving extractive to service based industries. The concept of sustainabilty is being incorporated into economic developments. Ecosystem management is gaining support and the realization that more effort must be made in coordinated management. Much more needs to be learned and understood about the GYE which will require the cooperation and involvement of all the government agencies, private industries, and local communities.

Integrated Public Lands Management: Principles and Applications to National Forests, National Parks, Wildlife Refuges, and BLM Lands

John B. Loomis
Columbia University Press. New York, ©1993 pp 474

This is a comprehensive text on how the theories and techniques of public land planning and management are applied to the management of resources of National Forests, Parks, and Wildlife Refuges. The last chapter discusses ecosystem management and the attempts for coordinated planning and possible ways to achieve it. Budgetary realism is stressed first. If only parts of a plan are adequately funded or if the plans are insufficiently funded, then even the best plans will founder as managers try to cut and juggle their funds. Plans must also be approached on the ecosystem scale which means that neighboring agencies will have to coordinate with each other. The coordinated planning would begin on the federal level and follow down through to the state, local and private sectors. All within a particular ecosystem would adhere to one management plan. In the case of private landowner, incentives must be provided to ensure participation.

The Greater Yellowstone Area Plan and a state and a federal bioregional approach to resource management in California were used as case studies. The Greater Yellowstone Plan was an early attempt at ecosystem management with coordinated planning that was ahead of its time. Although it did not enjoy full support at the time, it still serves as a model for now and the future. The more recent California case study was state and federal coordination initiated on the state level has seen great success.

> "If federal land management agencies can successfully participate with state and local governments and private landowners in California in attaining biological diversity, then comprehensive ecosystem planning may replace the current inward-focused administrative planning." (pg 458)

Land Conservation Through Public/Private Partnerships

Eve Endicott
Lincoln Institute of Land Policy. Island Press. Washington, D. C. ©1993 pp. 361

"In order to stretch scarce resources, the federal government is placing more emphasis on partnerships and joint ventures."

-Senator John H. Chafee

This book presents example after example of successful joint ventures between federal, state, local and nonprofit organizations for land conservation. A large focus is placed on nonprofit organizations. They have the speed and flexibility needed to compete in the real estate market for land acquisitions. They are able to finance transactions creatively, bid at auctions, and take advantage of tax breaks, all of which the government cannot do. Nonprofit organizations also tend to bring an "air of possibility" with them. Often times they are the bridge to landowners suspicious of the government. We also see how nonprofit organizations need the government. Land acquisition has become more expensive and private donations alone are not enough. Today's increasing emphasis to work on a landscape and ecosystem scale means crossing multiple jurisdiction making it necessary to work with the government. In the past the partnerships were formed from crisis. But with the focus on larger scales, it is becoming more important for these partnerships to start at the planning stages. The case studies described detail the myriad ways in which land acquisitions or conservation easements were achieved. Each case is unique, but such commonalities as shared visions, constant communication, flexibility, and others are manifested.

Evaluating Landcare groups in Australia: How they facilitate partnerships between agencies, community groups, and researchers.

Allan Curtis and Terry DeLacy
Journal of Soil and Water Conservation. Jan-Feb 1995. pages 15-20.

Landcare groups in Australia are seen as the model for effective community action toward more sustainable resource use. "The key assumptions underlying landcare are that with limited government funding, landcare group action will facilitate the process of community development, produce more aware, informed, skilled, and adaptive resource managers, and thereby result in the adoption of more sustainable natural resource management practices." What is different from past group approaches is the degree of autonomy and freedom to define their own objectives and activities. In these partnerships with local communities, the government tries to combine technical expertise, access to funding sources, commitment of agency staff with the indigenous knowledge, skills, energies of the local participants. Results from the evaluation of the Victorian groups show a relationship between certain activities and the more successful groups. A great majority are involved in educational and promotional activities showing that they recognize the importance of education and publicity to shape community values. Almost all groups receive some sort of direct government assistance with many asking for more help

with leadership and group management skills. How much of an effect the group has on its community is difficult and perhaps too early to tell. However, "the perceived success of landcare can be attributed to the fact that landcare groups represent a new, participatory approach to resource management.

What is Ecosystem Management?

R. Edward Grumbine
Conservation Biology v 8, no. 1, March 1994 pages 27-38

Defining Ecosystem Management(EM) has been very problematic. It has different meaning for different users, in the same way that a policy will be interpreted and implemented differently by different agencies. Grumbine gives us a history of the evolution of Ecosystem Management beginning in 1932 with the call for interagency cooperation to ensure the success of the Ecological Society of America's Committee for the Study of Plant and Animal Communities. Ecological boundaries and interagency cooperation have been consistent parts of the debate.

Ten dominant themes were identified from the literature covering: hierarchical context, ecological boundaries, ecological integrity, data collection, monitoring, adaptive management, **interagency cooperation**, organizational change, humans embedded in nature, and values.

EM goals will focus on science, the long term view, and factoring in humans. The implications for policy are discussed. Scientists, policy makers, managers, and citizens are all have parts to fulfill. Organization, consensus building, value shifts, power relationships, timing, participation, and cooperation are some of the major issues to be addressed. The conclusion is that the past and present situation clearly shows the imperative to continue to pursue, modify, and improve Ecosystem Management for it is our future.

> "The strength of the Forest Service's current EM policy is that it explicitly calls for greater partnerships between scientists, managers, and citizens. The weakness of the policy is that the agency seems to be unaware of the radical implications of creating these partnerships."

Policy and Programs for Ecosystem Management in the Greater Yellowstone Ecosystem: An Analysis

Tim W. Clark et. al.
Conservation Biology v 5, no 3, September 1991 pages 412-422

This paper introduces the major natural resource agencies in the Greater Yellowstone Ecosystem(GYE) , reviews the problems preventing better management, discusses case studies to show existing policies and programs' effectiveness, and offers options for policy development and improved interagency coordination.

Over 28 federal, state, and local government entities manage the GYE and their mandates and policies often conflict. Among the problems are the lack of shared problem definition and

shared definition of ecosystem management. Unifying policy and goals are absent. The lack of consensus on goals makes it impossible to achieve those goals. Another impediment is the lack of data and inability to use existing data efficiently. All this results in the lack of coordination between agencies.

In the Forest Service (FS) case study (conservation of biodiversity on FS lands) four problems are manifest. The FS lacks the technical skills to do the job, there is inadequate understanding of management actions on biodiversity, inadequate allocation of resources to rectify the lack of understanding and support a change in management practices. The major problems are from lack of scientific understanding and lack of ecosystem coordination among managers.

The grizzly bear management case has been an over 20 year battle. On the positive side, this was a cooperative effort which involved federal and state agencies (the Interagency Grizzly Bear Study Team or IGBST). Another Interagency Steering Committee was formed to guide the IGBST. The ecological boundaries set included five national forests and two national parks and the recovery plan called for an aggressive approach to grizzly bear management in the lower 48 states. The obstacles grizzly bear recovery are human caused mortality, the fact that the number of bears needed for a sustainable population is unknown, and much of grizzly habitat is open to development. The grizzly bear's recovery will be an indicator of success of the policy and management plans in which effective interagency cooperation will be necessary to ensure long term viability.

The final case looks at the Greater Yellowstone Coordinating Committee (GYCC). Its membership includes many bureaucratic levels in the federal agencies. Its purpose was to initiate and improve communication and coordination between the national parks and national forests. The GYCC has no power to direct management. It can only advise. Thus far the GYCC has not been very successful and with it's "Vision for the Future" document it has come up against much political opposition. Problems with the committee are that it excludes the BLM, FWS, state fish and game agencies, the FS is over represented, and there is a lack of confidence from the public and conservation groups. It remains to be seen if the federal agencies will be able break away from their old traditions, values, and management ways.

Proposed solutions are grouped: (1) Development of a consistent and comprehensive conservation policy and specific management goals; (2) generation and use of policy-relevant knowledge; (3) reorganization and better management of agency bureaucracies; (4) upgrading technical concepts and tools and better information management.

Cooperation or Conflict? Interagency Relationships and the Future of Biodiversity for US Parks and Forests

R. Edward Grumbine
Environmental Management v 15, no. 1 1991 pages 27-37

Cooperation between the Forest Service and National Park Service has been advocated to protect biodiversity on national forests and parks. But cooperation has been low for ideological and political reasons that are imbued in their history. In spite of the long standing conflicts between

the two agencies, they will have to work together to achieve biodiversity goals. Cooperative agreements (Schonewald-Cox, 1987) are seen as the approach with the most promise. Examples of working relationships between the FS and NPS unfortunately show how the two do not cooperate (Endangered Species Act, Interagency Grizzly Bear Committee, biosphere reserves). Agee and Johnson (1988) put cooperation into a systems framework where cooperation is linked to ecosystem boundaries. Success will be based on achieving conservation biology goals. The role that people play must not be discounted and legislative reform will be a part of the process as well. Gilbert (1988) couples cooperation with the need for democratic, grassroots participation as well as executive leadership.

To have successful cooperation, the inertia from the past must be overcome. The agencies must realize that turfism and competition detrimental and limiting. Political gains from the rivalries are no longer there. Explicit goals are also a key to EM success but choosing which goals is not an easy, clear decision. Education could be the nonthreatening forum where agencies could begin working together. This education should also reach out to the citizens so that they can make intelligent, informed decisions. Involving the public and giving them more ownership in the decisions would definitely help further biodiversity goals. Coordinating mutually needed research is also another nonthreatening venue for cooperation.

The opportunities for cooperation are waiting and the necessity for cooperation is urgent. The values and views of people must be changed. Biodiversity must be valued for its inherent worth. Resources are not just what we can extract and use. The system must be seen as resource use within the ecosystem, not preserving the ecosystem around human development.

LITERATURE REVIEW CONCLUSION

Ecosystem management is being embraced as the new land ethic from the national level on down to the local levels of government. It is becoming a part of the public's vocabulary. Ethically and philosophically, ecosystem management is appealing with its talk about the 'big picture'. Looking at the environment at the landscape level, keeping a holistic view all seems to strike a chord with scientists, managers, policy makers, and the public. But how should such a system whose very definition has created great debate be implemented? The task is enormous and so many levels and details must be coordinated and resolved.

Partnerships are being looked upon as the best, if not the only way to make ecosystem management feasible. Their goals and objectives run the gamut from protecting biodiversity to conserving agricultural lands. What makes these partnerships different from the past is the magnitude of the task they are taking on. The task of resource management on the landscape scale is enormous and complex. Where the boundaries are and who has jurisdiction are not always clear. What is clear is that the job is too big for one community, organization, or agency. The scale and costs are too great for one entity to manage. The public agencies are having to cut back as their budgets are cut. Private and nongovernmental organizations are finding that the free market is making their projects too costly and they are not able to rely only on private donations. All these players are finding it necessary to cooperate to achieve a common goal. Joint ventures, cooperative agreements, and so on have been around for decades. Most of the partnerships were formed ad hoc in response to a crisis. The difference today is that there is a shift towards more long term partnerships as more become involved in the planning process. In the arena of land acquisition this is deemed necessary to avoid the situation of small natural landholdings surrounded by developments.

For as many different types of partnerships that exist, many methods have evolved. The following are some key elements identified from the literature for partnership success.

- A shared vision is extremely important in a partnership. This was the most stressed element by partnership participants. Without consensus for goals and objectives the partnership could not work to a common end and would lack focus and direction.

- Clear and constant communication is necessary. This is key to keeping the partnership on track, ensuring partners on clear on their roles and responsibilities, and promoting goodwill among partners. Having some sort of formal agreement also helps clarify who is responsible for what in the partnership.

- One leader is needed to direct, motivate, and keep the partnership's focus. There may by many people running the operation and making the decisions in the background, but to keep things unified and allow the partnership to move forward they must be willing to stay in the background. Too many leaders can too easily lead to friction that will weaken the partnership. There is a delicate balance between the participatory

democracy needed and the sense of ownership that the public also needs to have in the final decisions versus the leadership needed to propel the partnership forward.

- Local involvement is needed, especially in cases where a community's economic sustainability is closely linked to the quality of the environment around them. A partnership will more likely succeed when people involved have a personal stake.

- Publicity and education to spread and bolster partnerships and their practices. Positive publicity rallies the partnership, encourages other partnerships to form, and educates the public about the issues.

Many obstacles exist to hinder partnership management. Most often cited is government bureaucracy and turfism. Agencies' mandates and policies often conflict. Education and research are two possible areas where the traditionally competing agencies could work together towards mutual goals. This would be especially helpful in filling data gaps which are obstacles to ecosystem management implementation. Government bureaucracy is slow and cumbersome which is not only an annoyance, but also a great handicap because in many cases (ie, land acquisition or some crisis) there is some critical time frame. Antitrust laws could become a barrier to partnerships if they are seen as vehicles for price fixing. Despite the difficulties and obstacles, ecosystem management partnerships are becoming an accepted way of doing business.

Appendix 7

Colorado State University and RM Forest & Range Expt. Station

Colorado Front Range Ecosystem Managment
Research and Demonstration Project

CREATING AND SUSTAINING ECOSYSTEM MANAGMENT PARTNERSHIPS

Affiliation: Government Federal _____ State _____ Local

NGO -------- Private/Industry _____

HAVE YOU BEEN INVOLVED IN ANY ECOSYSTEM MANAGEMENT PARTNERSHIPS?

YES _____ NO _____

IF YES:

BRIEFLY DESCRIBE:

HOW LONG HAS THE PARTNERSHIP(s) EXISTED _____

WOULD YOU SAY THE PARTNERSHIP, IN TERMS OF MEETING ITS GOALS, HAS BEEN:

Successful	Moderately Successful	Neither Succ./ Unsucc.	Moderately Unsuccessful	Un-Successful
_____	_____	_____	_____	_____

WHAT DO YOU THINK ARE THE MOST IMPORTANT ELEMENTS FOR SUCCESSFUL PARTNERSHIPS

WHAT IS YOUR PREDICTION FOR CURRENT AND FUTURE ECOSYSTEM MANAGEMENT PARTNERSHIPS?

ELEMENTS FOR PARTNERSHIP SUCCESS

COMMON GOAL AND VISIONS

Non-workshop Summaries

- Common goals
- Shared interests/needs
- Shared vision
- A clear and common vision.

Colorado P'ships Mail Summaries

- Well defined goal
- Common goals
- Shared goals
- A shared vision
- Big vision; get the biggest idea you can

EM Survey 1 (Ft. Collins)

- Focus
- Clear goals
- Mission agreed upon
- Shared interests/Ability to find mutually compatible goals
- An agreed-to, mutually developed framework to guide activities.

EM Survey 2 (Colorado Springs)

- Mutual or shared goals
- Common vision of goals and objectives for the partnership
- Common goal/vision
- Develop common vision and goals
- Focus on the good of the whole so everyone "wins"
- Common cause
- Understanding goals and objectives

COMMITMENT

Non-workshop Summaries

- The time to implement and spend with the partners because of other duties
- Commitment/Dedication and willingness to work together for a common goal

COMMITMENT

Colorado P'ships Mail Summaries

- Long term commitment to partnership
- Strong commitment from line officers/management to make these efforts a priority for their stuff; equal to normal work duties in importance
- Regarding the partnership more highly than your own particular focus
- Willingness to work together even when it gets tough
- Voluntary
- Citizens (local) accepting the tremendous responsibilities involved in sustainable management of their resources
- Self-motivation
- Self-starters

EM Survey 1 (Ft. Collins)

- Commitment to work together
- Commitment
- Consistent participation
- Commitment of all partners to the stated objective
- Follow through on declared priorities
- Willingness to stand together behind policies and decisions.
- At a minimum, tacet approval by upper management to engage in partnerships

EM Survey 2 (Colorado Springs)

- Realization that resources are limited and things will not always go your way.

SUPPORT

Non-workshop Summaries

- Flexibility

Colorado P'ships Mail Summaries

- Institutional/organizational support from the top
- Funding commensurate with commitment
- Fund raising through donations, grants, and agencies
- Willingness to commit limited resources to meeting the goals and objectives
- Non-regulatory
- Clear delineation of duties/responsibilities & outline benefits of cooperative relationship
- Sharing workloads

SUPPORT

Colorado P'ships Mail Summaries

- Sharing of power, resources, and work
- Publicity

EM Survey 1 (Ft. Collins)

- Agency/organizational backing and support for the partnership mission
- NGO and FLM have to understand limitations of volunteers and the need to have coordinator of volunteers. Need to show volunteers they are appreciated.
- Non-threatening interagency political environment in which to work
- Adequate resources to accomplish
- Flexible management atmosphere
- Willingness to bend institutional rules.

EM Survey 2 (Colorado Springs)

- Supervision
- Trained employees
- Trained employees

COOPERATION

Colorado P'ships Mail Summaries

- Partners need to have similar time lines
- Partners must be rational & willing to work with the group and not only the implementation of their own agenda
- Be willing to let go of your personal agenda
- Partners must be able to give as much as get. There are no free rides.
- Practical, explainable science
- A partnership empowered to make decisions (consensus building)
- Government learning how to work with locally empowered citizen groups effectively in resource management
- Empowerment of the team
- Empowerment
- Mutual Education

EM Survey 1 (Ft. Collins)

- BLM must participate as an equal and not dominate the other(s) in decisions/implementations.
- Sharing of resources

COOPERATION

EM Survey 2 (Colorado Springs)

- Look beyond traditional "turf" and focus on the long term vision and "common good"
- Getting over barriers such as "turfism" and "lack of trust"
- Community cooperation.
- Shared decision-making with other stake-holders
- Share decision making

LEADERSHIP

Colorado P'ships Mail Summaries

- STRONG leadership
- A good facilitator
- Comment
- Having someone responsible (individuals or organization)
- Less red tape and big government
- Leaving the regulatory "hammers" at home

EM Survey 1 (Ft. Collins)

- Personal leadership and commitment from top management
- Strong leadership
- Willingness of leadership in involved organizations to make priority commitments of organization's resources

EM Survey 2 (Colorado Springs)

- Strong leadership by the group or a component of the group. Too often EM Partnerships try to distribute control but this is contrary to an effective implementation of a partnership

COMMUNICATION

Non-workshop Summaries

- Understanding of each other's bureaucratic limitations/opportunities

Colorado P'ships Mail Summaries

- Constant and open communications
- Open communiction
- Really listen

EM Survey 1 (Ft. Collins)

- People to listen and learn and compromise for the greater good

COMMUNICATION

EM Survey 2 (Colorado Springs)

- Written agreements
- Develop effective mechanism for communication
- Communication and compromise.

INCLUSIVE

Non-workshop Summaries

- Understand roles of each other and expectation

Colorado P'ships Mail Summaries

- Community based, strong linkages with local stakeholders
- Partners must be stakeholders
- Being inclusive; bring opposition on board
- Public participation
- Getting private parties to buy in early
- Inclusive of all interested parties

EM Survey 1 (Ft. Collins)

- A strong belief that there are efficiencies to be gained by lower level managers as a result of the partnership

EM Survey 2 (Colorado Springs)

- Diversity of citizens from all walks of life willing to work out workable decisions.
- Open to ideas and respect for needs and information of others
- Mutual understanding and respect for differing or even conflicting view points.

INCENTIVES & ACHIEVEMENTS

Non-workshop Summaries

- Recognition of partners in how their contribution made "x" possible and successful
- Celebration of successes

Colorado P'ships Mail Summaries

- In-the-field projects (they are rallying points)
- Final projects completed
- An incentive to do good things
- Incentive-based participation

INCENTIVES & ACHIEVEMENTS

EM Survey 2 (Colorado Springs)

- Economic incentives to encourage landowners to improve land use practices.
- Laws and regulations to get federal and state entities to improve land use practices.
- Recognition
- Results

TRUST & RESPECT

Non-workshop Summaries

- Mutual professional respect and (if possible) genuine liking of one another.

Colorado P'ships Mail Summaries

- Trust and honesty among partners
- Building of trust
- Rebuilding government trust beginning at local level and working up
- No intrusion on private property rights

EM Survey 2 (Colorado Springs)

- Trust